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A NOTE ON COLOR PREFERENCE

By M. LUCKIESH, Cleveland, Ohio

During the course of investigations in color science some data relating to color preference were obtained which will be recorded briefly. The Wundt (E. Zimmerman) colored papers were used but as there was no saturated green paper such a one was dyed and placed in the series. This color is designated as q, the other letters in the illustrations indicating the catalogue designations of the various colored papers. Fifteen colored papers each four inches square were spread out haphazardly upon a white surface, the individual colors being from six to ten inches apart. The observer was instructed to isolate the colors from everything as far as possible and to choose them in their order of preference for 'color's sake' alone. As the colors were chosen they were laid aside. One of the objects of the investigation was to ascertain if there was an appreciable difference in the order of preference when the colors were chosen under ordinary artificial (tungsten) light, T, and under daylight, D. (It is well known that the spectral character of an illuminant greatly influences the appearance of a colored object both as to hue and relative brightness.) The experiments were therefore carried out under the light from incandescent tungsten lamps operating at 7.9 lumens per watt and also under daylight from the blue sky as it entered a large window. In both cases the intensity of illumination was sufficiently high for examining colors with ease.

Fifteen observers were used for both sets of observations, the personnel being the same in both series. The time elapsing between the two tests for individual observers varied from one to four weeks. The colors were ranked from one to fifteen and the mean ranks for the individual colors (obtained by averaging the individual ranks of the fifteen observers) are plotted in Fig. 1. There may be some question regarding the legitimacy of this definition of color preference but the procedure adopted here appears to be satisfactory in this case and certainly provides a simple method for plotting the data. It is to be regretted that more observers were not

available but the data appears to lead to fairly definite conclusions. Lemon-yellow was placed last or next to last by a large majority of subjects as is evident by the fact that its mean rank is just above fourteen for both series. As seen in Fig. 1, deep blue ranked highest in the mean preference order although red-purple and three of the reds also ranked high.

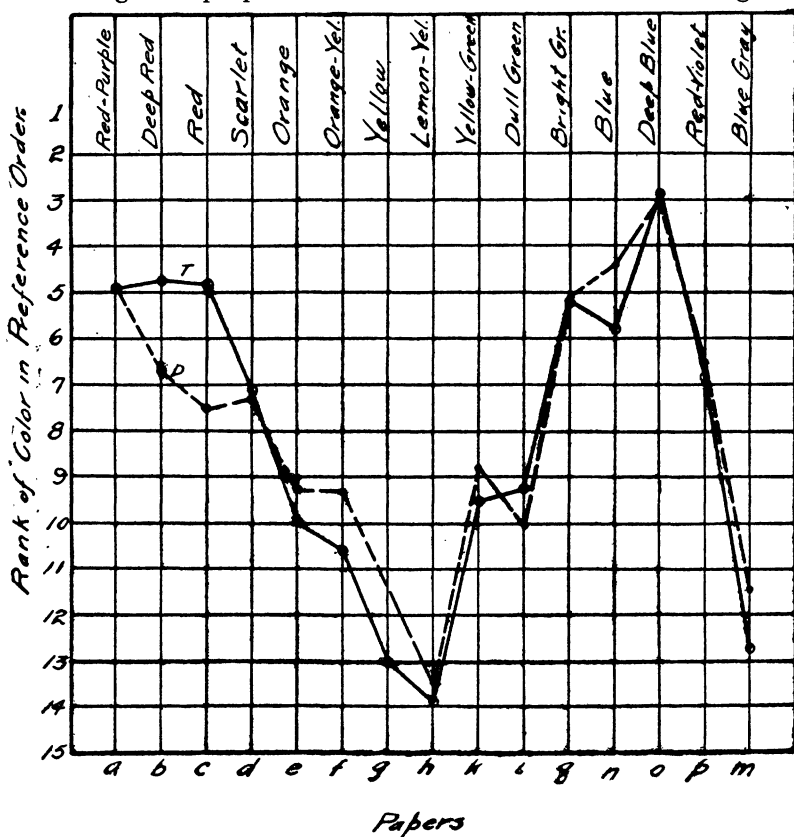


Figure 1

It is not surprising to find the reds ranking higher under the artificial illuminant (solid line) than under daylight (dashed line) although there appears to be little difference in the positions of the remaining colors in the two orders of preference. The latter may be accounted for possibly by the fact that the colors were quite saturated with the exception, *m*, on the extreme right, namely blue-gray. This color ranked quite low.

The colors have been arranged in the spectral order of their dominant hues as far as possible. In general the colors whose dominant hue lie near the ends of the spectrum are highest in the preference order. Such a result is consistent with conclusions drawn from other observations.

In Fig. 2 are plotted the mean deviations from the mean for each test color. A considerable variation is expected in such work and only when this variation is not too great is it

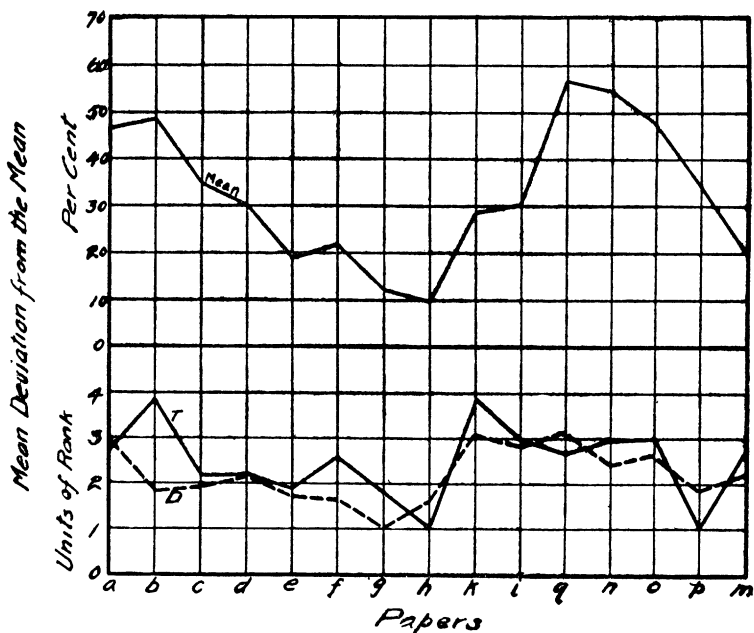


Figure 2

advisable to draw definite conclusions. At the lower part of Fig. 2 the mean deviations are given in terms of units of rank—there being 15 test colors and therefore 15 units of rank. A fair average mean deviation is somewhat more than two units of rank. The variations do not appear to be sufficient to endanger the conclusions drawn. In the upper part of Fig. 2 the mean deviations are expressed in per cent. Where the rank is high obviously the per cent. deviation is higher owing to the fact that the actual mean deviations as expressed in units of rank are approximately constant.

In Fig. 3 are plotted the reflection coefficients of the fifteen test colors for the two illuminants used. These of course

represent also their relative brightnesses as viewed under illuminations of equal and uniform intensity from the two illuminants. It is seen that the preference of a given saturated color is lower as the relative brightness of the color is higher. In Fig. 3 are also plotted the ratios of the brightness of each

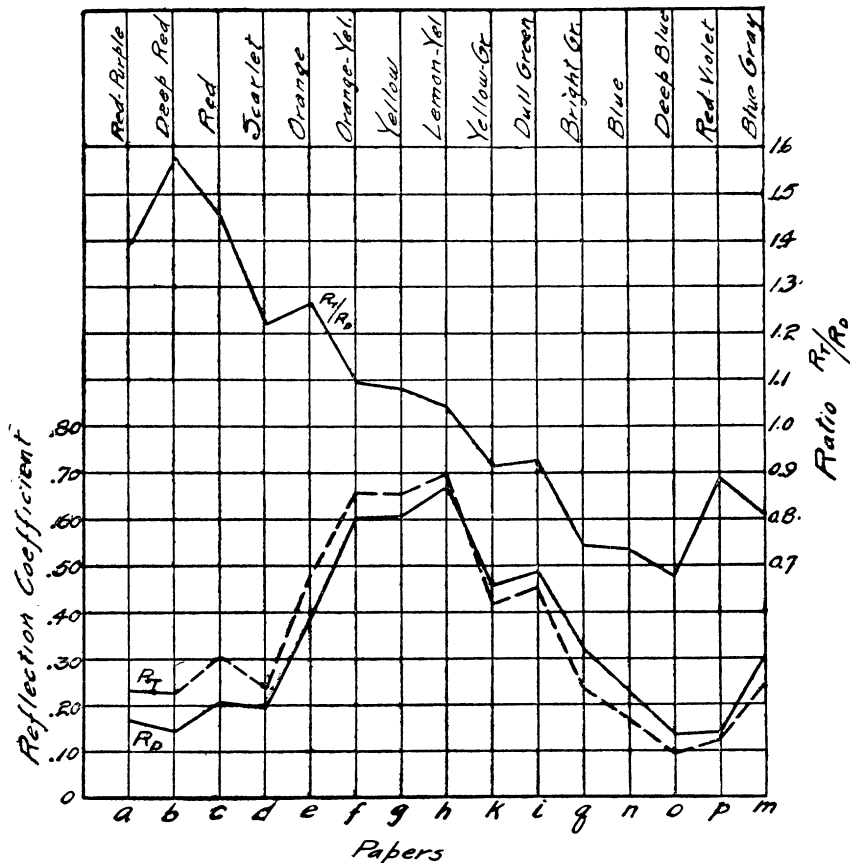


Figure 3

color under the artificial light to that under the daylight. Owing to the variation of daylight in spectral character and intensity it is advantageous to use "artificial daylight." This the writer¹ has found very convenient for investigations in color.

¹ M. Luckiesh, Artificial Daylight, *Electrical World*, Sept. 19, 1914. M. Luckiesh and F. E. Cady, *Trans. I. E. S.*, No. 8, 1914, p. 839.

According to E. B. Titchener there are two types of observers; one type prefers the saturated colors and the other definitely prefers unsaturated or 'artistic' colors but the former type constitutes a majority. It appears to the writer from these and other observations that, when colors are chosen for 'color's sake' alone, the saturated colors are almost invariably chosen. E. J. G. Bradford² in experimenting with twenty-six students with a set of fifteen papers, each about thirty inches square, found that saturated colors were most preferred. He also found that the admixture of a small proportion of another color lowered the position of the color in the preference order. Cohn³ has also contended that increase of saturation raised the position of a color in the preference order. Bradford found that the order of preference remained reasonably constant by performing the same experiments on three observers after an interval of two weeks and again after a lapse of twelve months.

It appears safe to conclude that, in a group of rather highly saturated colors, those, whose dominant hues lie near the ends of the visible spectrum, whose brightnesses are relatively low and whose saturations are relatively high (low per cent. white) are found to rank relatively high in the order of preference. Apparently the reds rank higher under incandescent tungsten light than under daylight. Not a sufficient number of colors of various tints and shades were used to draw further conclusions regarding the influence of the illuminant upon the preference order, however such an influence exists to an appreciable degree as is evident from daily experience.

² On the Relation and Aesthetic Value of the Perceptive Types in Color Appreciation. *Amer. Jour. of Psych.*, 1913, 24, p. 545.

³ Gefühlston and Sättigung der Farben. *Phil. Stud.*, 1900, 15, p. 279.